

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing of claims in the application.

1. (currently amended) A diode array end pumped multiple mode slab laser comprising:

a laser diode having at least one diode bar for providing laser pump light in a vertical and horizontal direction to the optical axis;

a first cylindrical lens for collimating said laser pump light in said vertical direction on said optical axis after said laser diode bar;

a second cylindrical lens on said optical axis perpendicular to and after said first cylindrical lens for collecting laser pump light output from said first cylindrical lens and focusing onto a laser slab cavity as focused laser pump light;

[a] said laser cavity on said optical axis after said second cylindrical lens, and comprising a laser slab of solid state crystal with a length and polished input and output ends, and further having a rectangular cross-section with rough ground top and bottom surfaces and polished side surfaces, the slab accepting as input said focused laser pump light at said polished input end with unabsorbed pump light reflected within the laser slab off the polished side surfaces and outputting from said polished output end absorbed laser energy, whereby laser pump light remains collimated perpendicular in said vertical direction throughout said laser slab and said pump light further includes laser mode overlap for focused laser pump light absorption along all of said laser slab length.

2. (currently amended) The diode array end ~~pump~~ pumped multiple mode slab laser of claim 1 wherein said laser cavity further includes a Q-switch having input and output ends on the optical axis, with dichroic coatings at said input and output ends, said Q-switch for producing peak power pulses.

3. (currently amended) The diode array end pumped multiple mode slab laser of claim 1 wherein said laser cavity further includes a non-linear crystal to produce additional wavelengths.

4. (currently amended) The diode array end pumped multiple mode slab laser of claim 1 wherein there is further included a non-linear crystal after said laser cavity on the optical axis for produce additional wavelengths.

5. (currently amended) A diode array end pumped multiple mode slab laser lasing technique comprising the steps of:

generating laser pump light in a vertical and horizontal direction to the optical axis;
collimating said laser pump light in said vertical direction with a first cylindrical lens;
providing a rectangular laser slab having a length, an input end, an output end, and
a rectangular cross-section with a top surface, a bottom surface and opposing side surfaces;

polishing said input end, said output end and said side surfaces;

receiving said laser pump light from said first cylindrical lens with a second cylindrical lens positioned between said first cylindrical lens and said laser slab; and,

focusing said laser pump light onto said input end with said second lens so that said laser pump light remains collimated perpendicular throughout said slab, and further so that said laser pump light reflects off said side surfaces throughout said length of said laser slab.

6. (new) A end pumped multiple mode slab laser comprising:

at least one diode bar for providing laser pump light in a vertical and horizontal direction to the optical axis;

a first cylindrical lens for collimating said laser pump light in said vertical direction on said optical axis after said laser diode bar;

a second cylindrical lens on said optical axis perpendicular to and after said first

cylindrical lens for receiving said laser pump light from said first cylindrical lens for further direction into a laser slab; and,

said laser slab having a length and polished input and output ends, and further having a rectangular cross-section with rough ground top and bottom surfaces and polished side surfaces to establish laser mode overlap and laser pump light absorption along all of said length.